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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/795,952	03/08/2004	Takashi Komura	TOW-066	1413

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EXAMINER	
CHUO, TONY SHENG HSIANG	
ART UNIT	**PAPER NUMBER**
1745	

DATE MAILED: 10/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/795,952	KOMURA ET AL.	
	Examiner	Art Unit	
	Tony Chuo	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 August 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) *10 and 11* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 12-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Claims 1-14 are currently pending. Claims 10 and 11 are withdrawn from consideration as being drawn to a non-elected invention. The objections to the specification are withdrawn. Claims 1-9 and 12-14 do overcome the previously stated 102 and 103 rejections. However, upon further consideration, claims 1-9 and 12-14 are rejected under the following new 103 and 112 rejections. This action is made FINAL as necessitated by the amendment.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear whether the first gas diffusion layer and second gas diffusion layer are part of the first or second power generation unit.

4. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear which surfaces the seal member is located at.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 2, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al (JP 2003-197225) in view of Haluzak (US 2003-0022051). The Maeda reference teaches a fuel cell comprising: a porous insulating film "120"; a plurality of power generation units "110" including a pair of adjacent power generation units "110"; where each power generation units include an anode electrode "111" (first electrode) facing said porous insulating film "120", a cathode electrode "112" (second electrode), and an electrolyte "115" interposed between first electrode and second electrode; a first electrically conductive film "211" electrically connected to first electrode of one of said adjacent power generation units, and extending in parallel to said first electrode; and a second electrically conductive film "212" electrically connected to said second electrode of the other of said adjacent power generation units, and extending in parallel to said second electrode, wherein first electrically conductive film or second electrically conductive film has an expansion "220" between said adjacent power generation units for connecting said first electrically conductive film and said second electrically conductive film and the electrolyte "115" is sandwiched between the first and second electrically conductive films "211" & "212" (See Drawings 4b). It also teaches first electrically conductive film "211" is arranged in a substantially same plane with a gas diffusion layer of said first electrode "111", and second electrically conductive film "212" is arranged in a substantially same plane with a gas diffusion layer of said second electrode "112" (See Drawing 4b). It also teaches a film "120" having windows "110" is

laminated on said porous insulating film "120" such that said first or second electrodes of said power generation units are disposed in said windows "120" (See Drawing 4a). However, the reference does not expressly teach a plurality of power generation units positioned on top of the porous insulating film. The Haluzak reference teaches a plurality of membrane electrode assemblies "60" that is positioned on top of a substrate "62" (See paragraphs [0027] and Figures 4 & 5). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Maeda fuel cell to include a plurality of power generation units positioned on top of the porous insulating film in order to provide a stronger support for the power generation units.

7. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al (JP 2003-197225) in view of Haluzak (US 2003-0022051) as applied to claim 1 above, and further in view of Winsel et al (US 3770509). However, the references do not expressly teach a first or second electrically conductive film that is made of a resin and an electrically conductive material. The Winsel reference does teach electrically connecting two gas diffusion layers with an electrically conductive resin comprising a plastic base material and a metal or graphite power (See column 3, line 63 to column 4, line 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Maeda/Haluzak fuel cell to include either a first or second electrically conductive film that is made of an electrically conductive resin in order to utilize a material that has high adhesive strength, electrical conductivity, and plastic flow.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al (JP 2003-197225) in view of Haluzak (US 2003-0022051) as applied to claim 1

above, and further in view of Nishiumi et al (US 2002/0187382). However, the references do not expressly teach a reactant gas supply passage and a reactant gas discharge passage that extends through an end of the fuel cell. The Nishiumi reference does teach a reactant gas supply passage "228" and a reactant gas discharge passage "229" that extend through an end of the fuel cell (See Figures 4 and paragraph [0048]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Maeda/Haluzak fuel cell to include a reactant gas supply passage and a reactant gas discharge passage that extend through an end of the fuel cell in order to able to supply and discharge the unit cells with reactant gases.

9. Claims 7, 9, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al (JP 2003-197225) in view of Kuroki et al (US 2003/0104262) and Narayanan et al (US 6680139). Maeda reference teaches a fuel cell comprising: a plurality of power generation units "110" where each power generation units include an anode electrode "111" (first electrode) facing said porous insulating film "120", a cathode electrode "112" (second electrode), and an electrolyte "115" interposed between first electrode and second electrode; a first reinforcing film "211" and a second reinforcing film "212" separate from the first and second electrodes wherein the first and second reinforcing film sandwich the electrolyte "115" of each power generating unit "110" (See Drawings 4b). It is well known in the art that anodes and cathodes each comprise a catalyst layer stacked together with a gas diffusion layer. However, the reference does not expressly teach a first end of the first electrically conductive gas diffusion layer that extends beyond a first end of the first catalyst layer and a second end of the second electrically conductive gas diffusion layer that extends beyond a

second end of the second catalyst layer; a first end of the first electrically conductive gas diffusion layer of the first electrode of the first power generation protruding toward the second power generation unit; a second end of the second electrically conductive gas diffusion layer of the second electrode of the second power generation protruding toward the first power generation unit; first and second ends that are electrically connected with each other by an electrically conductive member extending through the electrolyte; first and second electrically insulating separators for sandwiching the MEA unit; a fuel gas flow field facing the power generation unit that is provided on the first electrically insulating separator; and a oxygen containing gas flow field facing the power generation units that is provided on the second electrically insulating separator. The Kuroki reference teaches the first end of the first gas diffusion layers "15" that extends beyond the first end of the first catalyst layer "13" and a second end of the second gas diffusion layer "16" that extend beyond the second end of the second catalyst layer "14"; a separator "17" with fuel gas flow fields facing the power generation units and separator "18" with oxygen gas flow fields facing the power generation units (See Figure 8 and paragraphs [0144,[0146],[0147]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Maeda fuel cell to include a first end of the first electrically conductive gas diffusion layer that extends beyond a first end of the first catalyst layer and a second end of the second electrically conductive gas diffusion layer that extends beyond a second end of the second catalyst layer; first and second electrically insulating separators for sandwiching the MEA unit; a fuel gas flow field facing the power generation unit that is provided on the first electrically insulating separator; and a oxygen containing gas flow field facing

the power generation units that is provided on the second electrically insulating separator in order to be able to form a better seal around the extended portions of the first and second gas diffusion layers.

The Narayanan reference teaches a first end of the first gas diffusion layer of cathode "103" of fuel cell element "97" protruding toward the next fuel cell element "98"; a second end of the second gas diffusion layer of anode "104" of fuel cell element "98" protruding toward the fuel cell element "97"; and an interconnect "135" electrically connecting the first and second ends (See column 2, lines 12-19). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Maeda/Kuroki fuel cell to include a first end of the first electrically conductive gas diffusion layer of the first electrode of the first power generation that protrudes toward the second power generation unit; a second end of the second electrically conductive gas diffusion layer of the second electrode of the second power generation that protrudes toward the first power generation unit; and first and second ends that are electrically connected with each other by an electrically conductive member extending through the electrolyte in order to minimize the distance between the gas diffusion layers by directly connecting the gas diffusion layers thereby lowering the resistance of the electrodes and improving the performance of the fuel cell.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al (JP 2003-197225) in view of Kuroki et al (US 2003/0104262) and Narayanan et al (US 6680139) as applied to claim 7 above, and further in view of Badding et al (US 2004/0028975). However, the references do not expressly teach an electrically conductive rivet member. The Badding reference teaches a fill "203" that is an

electrically conductive rivet member. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Maeda/Kuroki/Narayanan fuel cell to include an electrically conductive rivet member in order to strengthen the electrically connection between the gas diffusion layers.

11. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al (JP 2003-197225) in view of Wilkinson et al (US 5773160). The Maeda reference teaches a plurality of power generation units "110" arranged in the same plane where each power generation unit includes first electrode and second electrode, and an electrolyte interposed between the first and second electrodes (See Drawing 4). However, the reference does not expressly teach a casing containing the fuel cells, a plurality of guide grooves that are formed on at least one of the separators on the surface opposite to a surface facing the power generation units for supplying a coolant along the separator; a coolant passage that is connected to the guide grooves of each of the fuel cells in the casing; a reactant gas supply passage and reactant gas discharge passage that extends through the fuel cells in the stacking direction of the fuel cells; and a seal member provided on the at least one of the separators on the surface opposite to the surface facing the power generation units where the seal member separates the reactant gas supply passage and the reactant gas discharge passage from the coolant passage and extends along an entire width of three surfaces of the at least one of the separators wherein two of the three surfaces are parallel to one another. The Wilkinson reference teaches a fuel cell stack "30" comprising a separator plate "210" comprising coolant flow channels "262" that are formed on the surface opposite to a surface facing the power generation units; coolant manifold "248"

connected to the flow channels; inlet reactant gas manifold "240" and outlet reactant gas manifold "242" that extend through the fuel cells in a stacking direction of the fuel cells; and a sealant material "264" provided on the surface opposite to the surface facing the power generation units that separates the inlet reactant gas manifold and the outlet reactant gas manifold from the coolant manifold and extends along an entire width of three surfaces of the separator wherein two of the three surfaces are parallel to one another (See Figures 6A & 6B and column 11 line 34 to column 12 line 5). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Maeda fuel cell to include a casing containing the fuel cells, a plurality of guide grooves that are formed on at least one of the separators on the surface opposite to a surface facing the power generation units for supplying a coolant along the separator; a coolant passage that is connected to the guide grooves of each of the fuel cells in the casing; a reactant gas supply passage and reactant gas discharge passage that extends through the fuel cells in the stacking direction of the fuel cells; and a seal member provided on the at least one of the separators on the surface opposite to the surface facing the power generation units where the seal member separates the reactant gas supply passage and the reactant gas discharge passage from the coolant passage and extends along an entire width of three surfaces of the at least one of the separators wherein two of the three surfaces are parallel to one another in order to utilize the fuel cells in a fuel cell stack that supplies and discharges reactant gases and coolant and seals the manifolds to prevent gas or coolant leaks.

Response to Arguments

12. Applicant's arguments with respect to claims 1-9 and 12-14 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's trainer, Susy Tsang-Foster can be reached on (571) 272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

SUSY TSANG-FOSTER
PRIMARY EXAMINER